IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method for pulse width modulation comprising the steps of:

providing a pulse width modulator having n bits of resolution and a nominal time period P_n;

supplying an additional timer to generate K associated states and having a timer period P_T, wherein K is greater than 2;

associating a modulator output value with each one of said K states; and

establishing a pulse width modulation update interval of $K*P_T$.

2. (Original) The method of claim 1 wherein P_T is an integer multiple of P_n.

3. (Original) The method of claim 1 wherein said pulse width modulator includes an overflow bit.

4. (Original) The method of claim 1 wherein $P_T = P_n$.

5. (Currently Amended) A method for improving the resolution of an n bit pulse width modulator having a nominal time period of P_n, the method comprising the steps of:

supplying an additional timer having K associated states, wherein K is greater than 2, and a timer period of P_T;

associating a modulator output value with each one of said K states; and

outputting a pulse according to said modulator output value during each time period P_n occurring within said timer period P_T during each one of said K timer states, whereby the resolution of said n bit pulse width modulator substantially equals n + log2(K).

6. (Original) The method of claim 5 wherein P_T is an integer multiple of P_n.

7. (Original) The method of claim 5 wherein said pulse width modulator includes an overflow bit.

8. (Original) The method of claim 5 wherein $P_T = P_n$.

9. (Original) The method of claim 5 where P_T is other than an integer multiple of P_n and $P_T >> P_n$.

10. (Original) The method of claim 9 wherein said pulse width modulator includes an overflow bit.

11. (Currently Amended) A computer program product for pulse width modulation comprising:

a computer readable storage medium having computer readable program code means embedded in said medium, said computer readable program code means having:

a first computer instruction means for associating K timer states, wherein K is greater than 2, with a timer having a period P_T; and

a second computer instruction means for reading a commanded pulse width modulation duty cycle;

a third computer instruction means for assigning an n bit modulator output value with each one of said K states according to said duty cycle.

12. (Original) The computer program product of claim 11 wherein said third computer instruction means updates said n bit modulator output value assigned to each state at time intervals of $K*P_T$.

13. (Withdrawn) A method for controlling the brightness of a display using pulse width modulation comprising the steps of:

receiving a commanded brightness level;

using an n bit pulse width modulator to assert a plurality of pulses in accordance with an output of said n bit pulse modulator wherein said modulator has a period P_n;

assigning a modulator output value to each one of K states of a K state timer wherein said timer has a period P_T;

outputting said plurality of pulses according to said modulator output value during each P_n period occurring within timer period P_T; and

supplying power to the display in accordance with said plurality of pulses.

14. (Currently Amended) An apparatus for pulse width modulation comprising:

an n bit pulse width modulator having a nominal modulator period P_n;

a timer to generate K timer states, wherein K is greater than 2, and having a timer period P_T;

a computing device for assigning a modulator output value to each of said K states; and

whereby said modulator outputs a plurality of pulses according to said modulator output value during each P_n period occurring within timer period P_T and whereby said pulse width modulator has a resolution of $n + \log_2 K$.

15. (Original) The apparatus of claim 14 wherein said timer is included within said computing device.

16. (Original) The apparatus of claims 14 where P_T is an integer multiple of P_n.

17. (Original) The apparatus of claim 14 wherein P_T is other than an integer multiple of P_n and $P_T >> P_n$.

18. (Original) The apparatus of claim 14 wherein said modulator further comprises overflow bit.

19. (Currently Amended) An apparatus improving the resolution of an n bit pulse width modulator having a P_n period, the apparatus comprising:

a timer to generate K timer states, wherein K is greater than 2 and having a timer period P_T;

a computing device for assigning a modulator output value to each of said K states; and

whereby said modulator outputs a plurality of pulses according to a modulator output value during each P_n period occurring within timer period P_T and whereby the pulse width modulator has a resolution of $n + \log_2 K$.

20. (Withdrawn) An LED backlit display comprising:

an array of LEDs;

an n bit pulse width modulator having a period of P_n;

a computing device for assigning a modulator output value to each of said K states;

whereby said modulator outputs a plurality of pulses according to said modulator output value during each P_n period occurring within timer period P_T and whereby said pulse width modulator has a resolution of $n + \log_2 K$.; and

a driver for supplying power to said array in accordance with said modulator output.

21. (New) A method for improving the resolution of a hardware based pulse width modulator, the method comprising:

generating a pulse width modulated signal during a first time interval having a first modulator output; and

generating multiple further pulse width modulated signals during multiple succeeding time intervals having selected modulator outputs; and

repeating the generation of such pulse width modulated signals during the first and succeeding time intervals to provide an overall duty cycle having a desired resolution higher than the resolution of the hardware based pulse width modulator.

22. (New) A method for improving the resolution of a hardware based pulse width modulator, the method comprising:

specifying a desired duty cycle;

determining a timer state;

if the state needs to be set at 100% duty cycle, setting the duty cycle to 100%;

otherwise, setting pulse width modulation of the pulse width modulator to an appropriate value for this state;

turning off a 100% duty cycle bit; and

incrementing a state counter for a next state.

SUBCT

23. (New) A system for improving the resolution of a hardware based pulse width modulator, the system comprising:

A1 cmdd

means for generating a pulse width modulated signal during a first time interval having a first modulator output; and

means for generating multiple further pulse width modulated signals during multiple succeeding time intervals having selected modulator outputs; and

means for repeating the generation of such pulse width modulated signals during the first and succeeding time intervals to provide an overall duty cycle having a desired resolution higher than the resolution of the hardware based pulse width modulator.